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•• REMARKS/ARGUMENTS ••

The present Preliminary Amendment is being filed together with a Request for Continued Examination.

By the present amendment, the limitations of dependent claim 2 have been incorporated into independent claim 1.

In addition, the limitations of dependent claim 4 have been incorporated into dependent claim 5 and claim 5 has been amended to depend from independent claim 1.

Dependent claims 2-4 have been cancelled.

Dependent claims 7-9 have been amended to depend from claim 1.

Dependent claim 12 has been amended to depend from claim 11.

Entry of the changes to the claims is respectfully requested.

Claims 1, 5, 7-30 and 32-29 remain pending in the present application.

In the Office Action of October 19, 2006 the Examiner rejected claims 1-5, 7-30 and 32-39 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,190,528 to LI et al. in view of U.S. Patent No. 3,226,628 to Kupferberg et al. or U.S. Patent No. 5,532,894 to Sweaton and further in view of U.S. Patent No. 5,558,753 to Gallagaher.

The Examiner has relied upon Li et al. as disclosing:

> ...a known electrodeionization module using conventional DC to obtain purified water (see col. 3, lines 20-66).

The Examiner concedes that LI et al. "does not disclose the converting of the power from the AC source into stable DC power."

The Examiner has relied upon Kupferberg as showing:

> ... a conventional power interface for converting the AC into stable DC (see col. 2, lines 22-46). The reference further discloses limitations to the transformer, phase-controller and rectifier as claimed, with the amplifier (see figures 2-6 and columns 3-6).

The Examiner has relied upon Sweaton as showing:

> ... another conventional power interface for converting AC into stable DC (see abstract). The patent further discloses limitations to the transformer, phase-controller and rectifier as claimed with the amplifier (see figure 3-4 and columns 5-6).

In combining the teachings of the prior art the Examiner takes the position that:

> ....the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the disclosure of the Li patent with the teachings of the Kupferberg or Sweaton patents, because both the Kupferberg and Sweaton patents teach conventional power interface for converting AC into stable DC.

The Examiner has conceded that "[t]he Li patent does not disclose the use of a constant current which is unaffected by the fluid properties."

Accordingly, the Examiner has relied up Gallagher as teaching:

...it is known in the art to use a constant current to an EDI module to produce the constant produce as claimed (see col. 10, lines 40-56).

Li et al. discloses an electrodeionization module that uses conventional DC to obtain purified water (see col. 3, lines 20~66).

As conceded by the Examiner, LI et al. does not disclose converting of power from an AC source into stable DC power.

Kupferberg et al. teaches a circuit for converting the AC into stable DC (see col. 2, lines 22~46).

Sweaton also discloses a circuit for converting AC into stable DC (see abstract).

Kupferberg et al. generally relates to power control circuits for electrical devices, and more particularly to overvoltage protection circuitry that is particularly useful in overdriving light sources such as lamps of overhead projectors. As such, Kupferberg et al. is not considered to be particularly pertinent to the applicant's disclosed invention, or more importantly to LI et al.

Sweaton is concerned alternating current regulators and, in particular, servo motor regulators for providing regulators alternating current or voltage. As such, Sweaton is not considered to be particularly pertinent to the applicant's disclosed invention, or more importantly to LI et al.

As conceded, LI et al. does not disclose converting of power from an AC source into stable DC power.

More importantly, there is no teaching or suggestion in LI et al. that a stable DC power

supply will enable the production of a stable quality water product.

The Examiner has relied upon Gallagher as teaching:

> ...it is known in the art to use a constant current to an EDI module to produce the constant produce as claimed (see col. 10, lines 40-56).

However, the Examiner has failed to consider the overall teachings of Gallagher which are presented as follows:

Gallagher discloses that the use of a constant current source in the prior art is associated with a disadvantage that is related to the electrodeionization arrangements, so that the potential across the compartments increases to unacceptable levels as the electrical resistance across the compartments increases due to gas generation, fouling or scaling, high purity level in depleting compartments, and the like.

To address and solve this problem, Gallagher developed system that is specifically designed to utilize a constant current source which system involves polarity reversal, flow reversal, double reversal, upward flow and other novel features which are designed to maintain parameters within the apparatus so that scaling and fouling are maintained within an acceptable range for employment of the constant current.

It is important to recognize that Gallagher does not disclose any solution or technical motivation to adjust the DC voltage/current output according to variances within the EDI, which includes factors such as, but not limited to, the fluid temperature, fluid flow rate, fluid quality, or variances in the AC source of in the construction of the EDI module, so as to produce a stable

quality of water.

It is a common concept in the art that in order to provide a desirable and stable quality water it is most important for an EDI apparatus to maintain parameters (stable operation condition) within the apparatus. It is also known in the art that current density (electric field intensity per unit area of ion exchange membrane) is an important key parameter in the process of deionization.

In the prior art, the electrical power interface configuration uses a simple bridge-type rectification for energizing such EDI modules. As a result, unstable currents between the electrodes are experienced due to variances which include factors such as, but not limited to, unstable or fluctuating feed water temperature, feed water flow rate and feed water quality, unstable or fluctuating EDI module input voltage, variances in construction of EDI modules themselves, etc. Due to system design, these variances result in unstable product water quality. Moreover, there are other variable factors as disclosed by Gallagher, such as gas generation, fouling or scaling, high purity levels in depleting compartments, and the like, which will further adversely influence the product water quality.

According to applicants' claimed invention, the EDI module is energized by DC power between an anode and a cathode. The DC power includes a transformer that is coupled to the AC source which can be adjusted for providing varying AC power at the transformer output. A phase-controller controls the operation of a rectifier based on the AC power and on a feedback signal from the DC power. An autotransformer adjusts the transformer so as to adjust DC

voltage/current output according to the fluid temperature, fluid flow rate, fluid quality, or variances in the AC source or in the construction of the EDI module, so as to produce stable quality water.

By the above, the parameters (operation condition) within the EDI apparatus of the present invention are dynamically maintained within a stable condition. In particular, the current density is maintained stable in the process of deionization, thereby ensuring stable product water quality. A further advantage of using this stable DC power is that an energy saving in DC power consumption is achieved via the electrical serial connection of a plurality of EDI modules, thereby reducing the current requirement.

It is submitted that Gallagher is not applicable to the primary and secondary references so that one skilled in the art would simply "use a constant current to an EDI module to produce the constant produce as claimed" as the Examiner suggests, and bases the combination of the prior art teachings on. Reliance upon isolated teachings in a reference is generally impermissible when the full teaching of the reference does not support the reliance in a combination.

Moreover, even if properly combinable, the resulting combination does not realize or render obvious applicants' claimed invention as noted above.

Entry of the present Preliminary Amendment and an early examination of the application are earnestly requested.

It is believed that the above represents a complete response to the Official Action and reconsideration is requested.

If upon consideration of the above, the Examiner should feel that there remain outstanding issues in the present application that could be resolved, the Examiner is invited to contact applicant's patent counsel at the telephone number given below to discuss such issues.

To the extent necessary, a petition for an extension of time under 37 CFR §1.136 is hereby made. Please charge the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 12-2136 and please credit any excess fees to such deposit account.

Respectfully submitted,

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